Evaluating Digital Distance Learning Programs and Activities

Studies, Practices, and Recommendations

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Executive Summary

This report presents a comprehensive evaluation of distance learning activities—particularly digitized activities—in developing countries. Some 120 recent evaluations have been compiled on distance learning activities involving information and communication technologies. These evaluations, termed digital distance learning (DDL) evaluations, primarily assess experiences with credit-based courses. We have found few evaluations involving digital noncredit courses, short seminars and workshops focused on developing countries.

A vast body of experiences, expertise and examples is available in the field of evaluations, enabling well-researched recommendations. But there are also important shortcomings and blind spots in the data. Unless an evaluation infrastructure is constructed, DDL in developing countries will continue to suffer from inadequate evaluation approaches and designs as well as from questionable findings.

The report starts by describing DDL. It then screens the literature evaluating DDL using a multidimensional framework. Five types of distance learning evaluations are categorized and reviewed. The first type of evaluations, performed by distance learning institutes, uses performance indicators to assess performance. Performance indicators can be culturally incorrect, however, and often do not focus specifically on DDL. Thus we recommend developing specific performance indicators when information and communication technology is a central characteristic of DDL efforts and assessing what has been done with the information derived from performance indicators.

The second type of evaluation, also performed internally, monitors student and client attitudes and perceptions as well as staff performance. There is abundant research on students’ and clients’ opinions about DDL. It appears that when digitization is not part of an integrated, holistic approach to distance learning, their attitudes tend to be negative. We recommend that DDL initiatives monitor students’ and clients’ knowledge of particular provisions as well as the level of penetration of the different delivery media used. At the same time, thought should be given to the relative importance students and clients attach to different delivery media.

We found both qualitative and quantitative evaluations of staff performance and staff training. Based on results from these studies, we recommend implementing a multiphase plan to develop the skills required in staff development, focusing on both short- and long-term objectives.

A third type of evaluation, performed by external reviewers, focuses on the socio-cultural environment, cost-benefit studies, feasibility studies and networks and network analysis. As to the socio-cultural environment, both the local and national levels should be taken into account when performing evaluations. This is also true when implementing distance learning initiatives in the workplace and in regional and community centers. We recommend:
Executive Summary

- Evaluating whether DDL projects offer opportunities to share resources.
- Seeking partners who can strengthen DDL initiatives.
- Analyzing communication channels and approaches to spread interest in digitized initiatives.
- Conducting research to define appropriate technologies for developing countries.
- Checking whether capacity building is needed in the project environment.

With regard to cost-benefit analysis, we incorrectly assumed that large numbers of cost-benefit analyses focusing on DDL were available. Moreover, there is evidence of a reluctance to carry out such analyses. However, cost-benefit analyses that have examined DDL are generally positive about this approach. Recommendations with regard to such analyses include:

- Defining nonfinancial costs and benefits to be incorporated in the analysis, next to value-driven benefits and societal or value-added benefits (such as pollution reduction).
- Determining the extent to which the variables in a cost-benefit analysis are derived from the DDL setting in a developing country.
- Determining whether the cost-benefit analysis is based on data gathered over a sufficiently long period.
- Focusing on the perspectives of different stakeholders when calculating costs and benefits.

With regard to feasibility evaluations, we found examples using multiple methodologies.

As to networks and network studies, we found that partnerships are important for the successful development of DDL; several evaluations investigated such partnerships. Studies also indicate that efforts to transfer DDL models from industrial to developing countries are not well received.

The fourth type of evaluation concerns the approach to stakeholders. When collecting data, it is important to recognize that stakeholders may have opinions, attitudes and perceptions about information and communication technology even though they do not necessarily have hands-on experience. Although the hypothetical question methodology is useful in interviewing stakeholders, this consideration must be acknowledged.

Recommendations include identifying stakeholders at various levels (target audience, institution, institutional network, national and international) and dimensions (educational, economic, socio-cultural). It would also be helpful to identify the congruencies and conflicts in the interests of stakeholders and discuss them beforehand. We also recommended determining the level of flexibility in the project to deal with differing interests of stakeholders and partners.

The fifth type of evaluation is not exactly a “type” but more a group of topics being evaluated in the context to distance learning: media selection and usage in DDL, total quality management and International Standards Organization (ISO) certification and studies focusing on computer-mediated communication.
The analysis indicates the importance of media selection when doing distance learning and evaluations. The analysis also reveals that total quality management of DDL is indeed possible, and there are cases in which such an approach has been evaluated. The same is true for ISO certification. In any case, checking the validity and reliability of data used in a total quality management process is recommended.

The principles of effective face-to-face communication do not transfer directly to the design of computer-mediated instruction. Nevertheless, several studies indicate that computer-mediated communication can be an effective means of transferring knowledge.

The report ends by bringing together blind spots, forgotten variables and promising directions when evaluating DDL. Some of them are:

- The minimal attention paid to the underlying program logic of distance learning activities, particularly digitized activities. The same can be said about pedagogical transfer mechanisms and scenarios. McNeil (1998) finds that leading educators had widely varying opinions regarding the Internet as a tool of distance learning. Given these differences, articulating and evaluating social, cognitive and behavioral assumptions underlying the Internet as an education tool is strongly recommended.
- The scarcity of information on the impact DDL evaluations have had on decisionmakers, teachers and trainers. Utilization of evaluation findings is addressed infrequently.
- Though information and communication technology opens up new avenues for data collection, we did not locate many studies exploring these technologies.
- While considerable importance is attached to networking and partnering, limited attention is paid to these variables. In the evaluations referred to herein, a traditional approach to networking focuses on institutional collaboration. We did not encounter studies in which networks were empirically charted, nor did we find studies that show how networks can be managed.
- There are only a few evaluations of short-term teaching and training programs. Most of the evaluations investigated programs with a focus on credits and academic degrees. Given the World Bank’s and Economic Development Institute’s focus on short-term DDL, this is an important blind spot.

There are, however, a number of promising activities:

- Performance monitoring using the new opportunities that digital technologies offer for data collection and analysis.
- Increasing knowledge about the impact of computer-mediated communication. Computer-mediated communication provides new ways to involve a large and varying number of stakeholders in the evaluation process. In addition to building on the information that can be obtained through direct interaction, background monitoring and logging of data usage and interaction patterns can be conducted. Computer-mediated communication systems can document who
contacted whom, show which data were accessed by users and when, determine peak data access periods, determine which individuals and groups are most often involved in data access activities (creaming) or hardly ever (social marginalization) and analyze the performance of the infrastructure (peak usage, system failures and so on).

- The development of a systems-level type of evaluation.
Introduction, Questions Asked and Approach Adopted

For the World Bank and the World Bank Institute (WBI) in particular, distance learning focuses on courses and policy seminars for professional development, often without official credits or degrees. Because one of WBI’s goals is to “deliver usable knowledge to those who need it when they can best put it to use” (Thomas, 1996:9), the focus is on the power of learning. Given the geographic distances that have to be bridged by the World Bank and WBI, it is crucial to evaluate distance learning and training—and in particular, digitization of that process.

The importance of distance learning for the World Bank is evident in the recently launched World Bank Learning Network (worldbank.org/education/wdln/index.htm) and in the more traditional workshops and seminars facilitated by WBI. The World Bank Learning Network recognizes that distance learning is an essential component of WBI’s training efforts. To that end, WBI has established a Distance Learning Unit to serve as the focal point for Bank efforts to use information and communication technologies to meet client learning needs. This unit works with task managers to develop distance learning courses and provides an infrastructure that allows clients to access distance learning services and technologies throughout the World Bank Learning Network. In all its activities, the unit emphasizes that effective distance learning depends on an integrated mix of technologies and media—and in particular, on providing learners with appropriate support services.

The more than 400 courses offered by WBI and the World Bank form a large knowledge base for distance learning. But distance learning and training involves more than mailing or taping course materials. An instructional or pedagogical model—using state-of-the-art information and communication technology—is needed to realize an efficient and effective transfer of knowledge. Also essential is thorough evaluation of course materials and of participants’ assessments and achievements.

WBI-facilitated seminars for policymakers, practitioners and others also show the growing importance of distance learning on subjects ranging from privatization in transition economies to anticorruption efforts in Uganda and Tanzania. If WBI decides that distance learning and training should play a more prominent role, it should sharpen its tools for evaluating this approach.

1.1. Questions Asked

This report uses recent evaluations to examine the process of evaluating distance learning and training in terms of transferring knowledge, collaborative learning and developing competencies through state-of-the-art information and communication
technologies. Although the focus is on developing countries, a lack of data necessitates usage of findings from other parts of the world (such as Eastern Europe).

The report answers the following questions:

- What types of evaluations have been carried out, how can they be categorized and what are some of the main results (section 3)?
- Do blind spots and forgotten variables factor into the evaluation of digitized distance learning (section 4.1)?
- How important is an evaluation infrastructure if (digitized) distance learning is to be developed, implemented and improved, and what are the central characteristics of such an infrastructure (section 4.2)?
- What recommendations can be derived from our study of (digitized) distance learning evaluations (section 5)?

1.2. Approach Adopted

To meet the report’s objectives, we:

- Elaborated a frame of reference to describe the range of evaluation approaches that are relevant for (digitized) distance learning and categorized those approaches.
- Analyzed available data and new data obtained from recent project reports, publications and conference proceedings (more than 2,000 documents) in the field of distance learning. Priority was given to the analysis of recent information.
- Consulted experts—more than 50 were contacted—and centers of excellence to trace exemplary projects and initiatives (sections 9 and 13).
- Documented the frame of reference with as many actual and recent examples as possible.

1.3. Restrictions Under Which this Study was Carried Out

The evaluations referred to in this report do not always focus on digitized distance learning. In many cases the perspective is primarily on other forms of distance learning and training, sometimes only including innovations in the field of digitization. The reason is simple: digital distance learning is still in its infancy.

In addition, most of this report is based on evaluations of forms and types of (digitized) distance learning that lead to credited courses and degrees. The reason is that the number of evaluations in the field of distance training and education related to short-term courses and training, policy seminars and expert workshops is limited, and for developing countries, extremely limited. However, as more attention is paid to collaborative learning, development of competencies, transfer of practitioners’ knowledge and information and communication technologies—both
in distance learning programs focused on credits and degrees and in short-term (nondegree) training—the overview presented herein will be increasingly relevant for the World Bank and for EDI/WBI in particular.

What we did find regarding non-credited courses in Europe and the USA will now be summarized.

In Europe the Association of European Correspondence Schools (AECS) represents 65 private institutes/companies that are involved in non-degree courses. Analysis of information obtained from AECS (http://www.xxlink.nl/aecs/index.htm) does not reveal an explicit policy and/or approach focused on evaluation. Interesting is that AECS has developed a quality guide to safeguard the standards and maintain quality to ensure the credibility of non-credit distance education.

In the USA the American Association for Training and Development we refer to. In a recent study the following topics are discussed. First it was shown that “industries that deliver training via the Internet or intranets doubled their activity between 1996 and the first quarter of 1997.” Several examples were given, like CBT Systems that markets to large companies training courses delivered over their intranets, Logical Operations Interactive and Microsoft Online Learning Institute. The report also states that “although the use of the Internet and intranets to deliver training is not yet widespread, it’s expected to jump dramatically in the next three years. Eighty-one percent of the companies that are members of ASTD’s (American Society for Training and Development- www site) Benchmarking Forum anticipate an increase in using the Internet for internal training.” The ASTD study goes on to say that a critical question concerning learning technologies is their cost-effectiveness compared with traditional training approaches. Unfortunately, there’s little solid research comparing the cost-effectiveness of traditional versus electronic approaches. Nevertheless, here is some evidence that electronic learning technologies can be highly cost-effective.

- A consortium (Government Alliance for Training and Education) reports that training time and costs have been reduced significantly by distance learning at the U.S. Department of Energy and Federal Aviation Administration;
- The U.S. Coast Guard has used multimedia for several training initiatives, resulting in significant annual savings due to less need for instructors;
- At the AT&T Center for Excellence in Distance Learning, videoconferencing and other distance learning resulted in significant cost savings;

1. Nearly all members of the European Community are represented in the Association of European Correspondence Schools (AECS). But the AECS has also members in Iceland, Norway, Russia, Switzerland, and Turkey. With 4,000 different courses the members of the AECS work with more than one million students all over Europe.
• A 1992 study by Pennsylvania State University suggests that employee retention during training via distance learning is equal or superior to classroom instruction. Another study shows that interactive video-based instruction achieved a 25 to 50 percent higher retention rate than classroom instruction. More evidence shows that the quality of learning is higher with either interactive CBT training or other self-directed, computer-based training than traditional instruction;

• The speedy rate of training delivery is a clear advantage of most electronic learning technologies. Case studies show that self-paced, multimedia training can take 20 to 80 percent less time than instructor-led training, due to a tighter instructional design and learners’ option to bypass content already mastered. A survey of more than 100 companies shows that multimedia training can reduce learning time by 50 percent, compared with classroom training;

• Companies such as Apple Computer, Andersen Worldwide, and Storage Technology report less training time with multimedia. Storage Technology technicians who were once required to travel to a central location for four to 10 days of training now receive training through a localized multimedia system, saving $1.5 million over a three-year period;

• Some studies suggest no significant difference between new and traditional training approaches in terms of learning and employee satisfaction (http://www.usdla.org/dl.html, 1997).

What is Digital Distance Learning?

Distance learning is moving from a second-generation approach toward a third-generation approach that relies on information and communication technologies, including television, satellite, radio, the Internet, CD-ROMs, CD-I, CD-V and DVD. We call this new approach digital distance learning (DDL).

The earlier, second-generation\(^1\) approach reflected an industrial design, production and exploitation model that relied on ready-made comprehensive (mainly print-based) packages. This approach is still predominant in many distance learning institutions and projects. It represents a supply-driven mode of education, in clear contrast with the current trend to present demand-driven education (Kirschner and Valcke 1995).

DDL is presented as a revolutionizing solution for distributing learning opportunities, increasing access to education, delivering more effective and efficient education and realizing demand-driven education. But as is shown in this report, evaluations also show that the revolutionizing impact of DDL is not always clear, and often depends on conditions in the actual DDL setting or its context.

The third-generation approach to distance learning builds on the potential of information and communication technologies. These technologies are expected to facilitate and support basic characteristics of a specific educational approach underpinning the DDL model. Table 1 shows how these characteristics are related to the second generation of distance learning. These characteristics explain why the third generation is interested in realizing “contact at a distance.”

Table 1. Comparison of Second- and Third-generation Approaches to Distance Learning

<table>
<thead>
<tr>
<th>Second-generation</th>
<th>Third-generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predominance of individual learning approaches</td>
<td>Collaborative learning activities; emphasis on interaction and communication</td>
</tr>
<tr>
<td>Print-based materials</td>
<td>Multimedia-based materials</td>
</tr>
<tr>
<td>All materials equal for all students</td>
<td>Flexible adaptation of materials to student needs and characteristics</td>
</tr>
<tr>
<td>High investment in a prior design and development of learning materials</td>
<td>High investment in the exploitation phase</td>
</tr>
</tbody>
</table>

1. The second-generation approach builds upon the experiences from the first generation model, which has also been called the correspondence model of education.
A wide variety of information and communication technologies are used in DDL (see also Bates 1995 and Fulzele 1997):

- Face to face human contact
- Printed text (with graphics)
- Audiocassettes
- Videocassettes
- Telephone support and teaching
- Computer-based learning (computer assisted learning, computer-managed learning)
- Cable television
- Satellite television
- Computer-based audio-graphics (combining teleconferencing and computer data exchange)
- View data
- Tele-text
- Videodiscs
- Computer controlled interactive video
- Videoconferencing
- Electronic mail
- Computer conferencing
- Internet
- Computer-based multimedia
- Remote interactive databases
- Virtual reality.

Most DDL initiatives use a mix of technologies, in line with the different educational and didactic functions the technologies support. Bates (1995) gives a projection of the possible relationship between media, technology and distance learning applications of the technology (Table 2).

| Table 2. Interrelation between Media and Educational Potential |
| --- | --- | --- |
| Media | Technologies | Distance learning applications |
| Text | Print | Course units, supplementary materials, correspondence tutoring |
| | Computers | Databases, electronic publishing |
| | | Programs |
| | | Telephone tutoring, audioconferencing |
| Audio | Cassettes, radio | Programs: lectures, videoconferencing |
| | Telephone | |
| Television | Broadcasting, videocassettes, videodiscs, cable, satellite, fiber optics, microwave, video conferencing | |
| Computing | Computers, telephone, satellite, fiber optics, ISDN, CD-ROM, CD-I, CD-V | Computer-aided learning, electronic mail, computer conferences, audio-graphics, databases, multimedia |
Though a wide variety of technologies have potential to be used in distance learning, some are more common than others. Bates (1995) indicates that in distance learning the five most important media are (in order of importance):

- Direct (face to face) human contact
- Text (including still graphics)
- Audio
- Television
- Computing.

The level of interaction between technologies defines their educational potential in a DDL setting. Table 3 shows how two-way interactivity allows the realization of third-generation distance learning objectives.

The Internet is an emerging digital tool for distance learning. As Mason (1998) notes, “what is so remarkable about the Web, and undoubtedly accounting for its popularity with such a diversity of users, is its capacity to bring together a range of otherwise disparate technologies, opportunities for designing courses and competing providers of resources for learning. Its versatility can be summed up in the notion that anyone can publish and broadcast on the Web and thus reach large numbers of intended and unintended receivers. Users can choose to access learning materials, to communicate with fellow learners or to prepare their own personal pages. It supports real time personal interaction with its high tele-presence through visual and auditory connection, yet it also provides outstanding facilities for asynchronous resource sharing and communication.”

In EDI’s Forum (1998:9–12) McNeil (1998: 10) cites leading educators who gave their views of the Internet and its usefulness as an educational tool: “almost all predicted the Internet would change the teaching profession in some way. Many discussed the value of virtual classrooms for older, part-time students and the flexibility the Internet provided them. Others cautioned against the ‘butterfly defect,’ caused by the Internet, through which students bombarded by a mass of disjointed information are unable to construct it in a usable way.” The Internet as a tool of distance learning is discussed in greater detail later in this report.

<table>
<thead>
<tr>
<th>Media</th>
<th>One-way technology applications</th>
<th>Two-way technology applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text</td>
<td>Course units, supplementary materials</td>
<td>Correspondence tutoring</td>
</tr>
<tr>
<td>Audio</td>
<td>Cassette programs, radio programs</td>
<td>Telephone tutoring, audio conferencing</td>
</tr>
<tr>
<td>Television</td>
<td>Broadcast programs, cassette programs</td>
<td>Interactive television (TV out and telephone in), videoconferencing</td>
</tr>
<tr>
<td>Computing</td>
<td>Computer-assisted learning, computer-managed learning, computer-based training, databases, multimedia</td>
<td>Electronic mail, interactive databases, computer-conferencing</td>
</tr>
</tbody>
</table>

Despite the Internet’s significant potential, a number of issues appear to inhibit its application in distance learning settings in developing countries. Inhibiting factors include not just the availability of technology but the need to ensure that DDL is tailored to the national, regional, or local setting. This point is addressed later.
Evaluations of distance learning can assess monitoring activities, total quality management approaches and definitions and uses of performance indicators. Because the literature on evaluations is extensive (see Calder 1994; Flagg 1990; Thorpe 1988; Mason 1992, 1995; Kess and Pyykönen 1998; Kemmis 1980; Lee 1994), we focused on five types of evaluations (Table 4).

All the evaluations relied on empirical data. Excluded were studies that focused on past efforts or future directions that lacked a solid empirical basis. In addition, both internal and external evaluations were used. Internal evaluations are carried out by or under the supervision of a distance learning institute or organization. External evaluations are carried out by outside experts. (See Sonnichsen 1994 for more information on the importance of this differentiation.) We did not categorize evaluations found under traditional headings such as the types of designs used (sample survey, case study or different types of experiments) or the formative versus summative approach (GAO 1991; Rossi and Freeman 1993). Sometimes several designs were used simultaneously, making categorization difficult. Still, the categories used in this report are in line with those to which distance educators are accustomed.

To orient the reader when reviewing the evaluations, we use a graphical representation depicting the five types of evaluations. Gray coloration indicates the type of evaluation being discussed.

### Table 4. Overview of Evaluation Types

<table>
<thead>
<tr>
<th>Type of evaluation</th>
<th>Section in this report</th>
<th>Number of studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluations carried out internally that focus on analyzing performance</td>
<td>3.1</td>
<td>13</td>
</tr>
<tr>
<td>Evaluations carried out internally that monitor the attitudes and perceptions of students and clients and assess staff performance</td>
<td>3.2</td>
<td>11</td>
</tr>
<tr>
<td>Evaluation studies carried out externally that focus on the socio-cultural environment, visibility, feasibility, cost-effectiveness and networking</td>
<td>3.3</td>
<td>28</td>
</tr>
<tr>
<td>Evaluation studies that use a stakeholder approach</td>
<td>3.4</td>
<td>5</td>
</tr>
<tr>
<td>Other approaches</td>
<td>3.5</td>
<td>26</td>
</tr>
</tbody>
</table>
3.1. Internal Evaluation Studies based on the Analysis of Performance Data

3.1.1. Methodological Considerations

There is a tradition in distance learning of conducting surveys to gather client and student data for further analysis. Comparable techniques are being adopted in DDL,
facilitated by new information and communication technologies. Schultz and others (1997) criticize the traditional survey approaches and present a set of more innovative approaches in line with the potential of information and communication technologies. After considering the strengths and weaknesses of traditional techniques (Table 5), they advance an approach based on the use of satellite broadcast television (the OFEK-system).

The OFEK system is used to present multiple choice questions to students at any location. This evaluation procedure takes place during a special intermission during class. Questions and possible responses are presented on screens, and students punch in their choices on telephone keypads. Response data are then stored for subsequent analysis. This survey method combines face to face interviews and group interviews. It has some characteristics of face to face interviews primarily because the evaluator can ask complex questions and explain them online using

| Table 5. Critical Analysis of Classical Survey Techniques in Distance Learning |
|----------------------------------------|----------------|----------------|----------------|
| Aspect of survey                      | Mailed         | Telephone      | Face to face   |
| Administrative and resource factors   |                |                |                |
| • Cost                                | Low            | Low to medium  | High           |
| • Length of data collection period    | Long           | Short          | Medium to long |
| • Geographic distribution of sample   | May be wide    | May be wide    | Must be clustered |
| Questionnaire issues                  |                |                |                |
| • Length                              | Short to medium| Medium to long | Long           |
| • Complexity                          | Must be simple | Short and simple| May be complex |
| • Control of question order           | Poor           | Very good      | Very good      |
| • Use of open-ended questions         | Poor           | Fair           | Good           |
| • Use of visual aids                  | Good           | Not possible   | Very good      |
| • Use of personal records             | Very good      | Fair           | Very good      |
| • Rapport                             | Fair           | Good           | Very good      |
| • Sensitive topics                    | Good           | Fair to good   | Fair           |
| • Nonthreatening questions            | Good           | Good           | Good           |
| Quality issues                        |                |                |                |
| • Sampling frame base                 | Usually low    | Low            | Low            |
| • Response rate                       | 45–75%         | 20–90%         | 65–95%         |
| • Response bias                       | Medium to high | Low            | Low            |
| • Knowledge about refusals            | Fair           | Poor           | Fair           |
| • Control of response situation       | Poor           | Fair           | Good           |
| • Quality of recorded response        | Fair to good   | Very good      | Very good      |

Source: Schultz and others 1997.
visual aids. Experiences with this new approach show higher student involvement, higher response rates and a richer set of evaluative data.

When the Netherlands Open University introduced its new “Studienet” (an Internet-based working environment for students), part of the baseline evaluation studies were conducted through the Internet. Students can answer online questionnaires and checklists and become involved in evaluative discussion groups. This new approach is gradually replacing the traditional paper and pencil method for developmental testing and follow-up studies to monitor course quality.

3.1.2. Performance Indicators

The development of baseline studies introduces a discussion about performance indicators. Common indicators are listed in Table 6.

Most performance indicators are institution-specific. In the context of this report, the question regarding the extent to which this situation reflects a specific DDL tradition was explored. Does it take into account the potential of information and communication technology and its impact on performance? Neither in the available literature nor in practitioners’ reports were found a thorough rethinking of performance indicators in view of digital possibilities.

Ramanujam (1997), evaluating DDL in the context of developing countries, questions why the perspective of industrial countries often prevails in the selection of performance indicators. Instead of articulating and measuring their own performance indicators, developing countries often try to answer the following type of questions:

Table 6. Performance Indicators Applicable to Distance Digital Learning Settings

<table>
<thead>
<tr>
<th>Input</th>
<th>Process</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student/client enrollment</td>
<td>Withdrawal rates</td>
<td>Number of graduates</td>
</tr>
<tr>
<td>Faculty credentials</td>
<td>Failure rates</td>
<td>Completion rates</td>
</tr>
<tr>
<td>Quality of facilities</td>
<td>Faculty and staff development</td>
<td>Total revenue generated</td>
</tr>
<tr>
<td>equipment/materials</td>
<td>Number of grievances</td>
<td>Number of participants</td>
</tr>
<tr>
<td>Staff qualifications</td>
<td>Number of courses offered</td>
<td>Number of people</td>
</tr>
<tr>
<td>Grants received</td>
<td>Clear goals/mission</td>
<td>Academic accomplishments</td>
</tr>
<tr>
<td>Advisory committee</td>
<td>Policies developed/</td>
<td>Student attainment</td>
</tr>
<tr>
<td>Internal funds allocated</td>
<td>guidelines and procedures</td>
<td></td>
</tr>
<tr>
<td>External funds raised</td>
<td>Variety of courses offered</td>
<td>Research projects</td>
</tr>
<tr>
<td>Entry qualifications of clients/students</td>
<td>Ratios</td>
<td>Papers written/published</td>
</tr>
<tr>
<td>Quality of equipment</td>
<td>Average turn around time</td>
<td>Revenue increases</td>
</tr>
<tr>
<td>Awards</td>
<td>Number of appeals</td>
<td>Student achievement awards</td>
</tr>
<tr>
<td>Recognition</td>
<td>Faculty and staff satisfaction/testimonials</td>
<td>Student performance grades</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Student employment upon graduation</td>
</tr>
</tbody>
</table>
• Can some sort of education reach the people?
• Can shrinking education budgets meet the minimum infrastructure requirements of new types of DDL?
• Do job opportunities exist for those who complete their studies through distance learning?
• Are there sufficient arrangements to enable the provision of education to those who want it, irrespective of its use value?

The performance indicators used in developing countries should instead reflect the final goal of the DDL program. In industrial countries the ultimate objective is to provide education to individuals. In developing countries the goals are more collective—contributing to nation building, reducing illiteracy, fostering rural development and providing health education, tribal education and education of socially disadvantaged groups (next to the usual academic, technical, and vocational program goals).

3.1.3. Findings on Performance

Only a few evaluations focused specifically on DDL experiences and outcomes in developing countries. In China, for example, television is widely used to deliver distance learning. Descriptive student evaluations helped the Human TV and Radio University detect the imbalance in the development of television education between big cities and remote districts (Zhenfang 1997). Such an analysis of descriptive data can improve follow-up DDL initiatives.

Griffith (1997) describes Costa Rica’s Telesecundaria project, which involves satellite broadcast of television programs to rural areas with fewer than 2,500 inhabitants. Program themes include mathematics, Spanish, social studies, science, art, and technology. The project has seen annual growth of 20 percent in students and teachers and 15 percent in schools. Telesecundaria is now serving as a model for similar applications in the region.

Analysis of data by Nhundu (1997) in Zimbabwe indicates the societal impact of distance learning on specific student audiences. When the national Center for Distance Education started in 1993, 30 percent of students in the program were female, compared with 20 percent in a parallel conventional program. By 1996, 54 percent of the students were female compared with 18 percent in the conventional program. Similarly, rural participation in university education has been greatly enhanced through distance learning: 78 percent of the students resided in predominantly rural areas.

Wu (1997) analyzes the experiences of older students in Taiwan (China) to see how distance learning, employing television broadcasting, could take into account special characteristics of that audience. She lists the following methods for improving the learning process for older students in the distance learning setting:

• Self-paced adjustment
• Organization of material
• The use of mediators
• Improvement of learning motivation
• The use of feedback.

Sungsri (1997) conducted comparable research involving more than 900 elderly people in Thailand. Some results were the following:

• Personal contact with experts, staff of related agencies, and abbots or monks was important;
• The place for Distance Education could be the own home, a local temple, a village Reading Center, or the local school.

Upreti, Youngblood, and Rotem (1997) studied the impact on learning achievement of learner interaction with tutors and fellow students in a DDL program for continuing nursing education in Nepal. Their findings suggest that students studying in distance mode benefit when:

• They have access to a well-trained local tutor when needed.
• They have a well-organized mechanism for contacting fellow students to get both moral support and content-specific help. This feedback mechanism could be in the form of study groups, study partners or other structured ways of facilitating student interaction, either in person or using interactive communication technologies such as e-mail or Internet chat rooms.

3.1.4. Conclusions
• Evaluations of distance learning focus on opportunities that information and communication technology provide for data collection.
• Performance indicators for the assessment of distance learning activities are widely available and can reveal detailed findings (such as the difference in coverage of distance learning between areas).
• Performance indicators can be culturally incorrect.
• Performance indicators specifically focused on DDL were not found in the research literature.

3.1.5. Recommendations
• When establishing DDL initiatives and goals, specific performance indicators should be developed when information and communication technology is central to distance learning activities.
• Follow-up assessments should be performed to determine the extent to which distance learning programs may have been modified using information from performance indicators.
3.2. Internal Evaluations Monitoring Attitudes and Perceptions as well as Staff Quality

3.2.1. Monitoring Attitudes and Perceptions

Moving from traditional media usage in distance learning to DDL brings about changes in the student attitudes and perceptions. Calder (1997) reports on these changes in a U.K. study. Two sets of in-depth semi-structured interviews were carried out with 34 participants, with an interval of six months between each interview. The study identified four factors that were likely to inhibit students’ demand for particular resources:

- Lack of awareness that the resource existed.
- Restricted access to the resource.
- Neither direct experience of using the resource nor knowledge of anyone in their networks with experience of using it.
- Lack of comfort with the resource.

Vunnam (1997) describes how the use of audio, radio, and video was studied by the Center for Evaluation in India. Follow-up studies helped clarify strengths and weaknesses of the technologies, especially student profiles. He discovered that a large number of technologies were hardly used, including the radio session, videotapes, and audiotapes. This is partly explained by the fact that clients were not aware of the existence of these media. Vunnam stresses that judgment about the adoption of new technologies should be made on the basis of educational and operational criteria.
rather than the level of technological sophistication. He provides a list of mission-
critical features for radio, video, and audio.

Another case study, again in India, elicited student and counselor responses on
the impact of technology (radio, audio, and video) on learning and support ser-
Vices (Rao 1997). Questionnaires sent to 6,000 students and 800 academic counsel-
ors revealed entirely different perceptions on technology use at the study and
training centers. The disparity between the expectations of university authorities
and those of students on some important issues called for serious rethinking. Stu-
dents often were not aware of the availability of different technology options. More-
over, Rao found that India’s education ethos—which is based on oral tradition and
rote learning—is not conducive to the instant adaptation of “high-tech gadgetry.”

Uppalapati (1997) developed a comparable study involving 600 students affili-
ated with three rural study centers. Building on data from a questionnaire, he found
that when a question was posed regarding opinions about print media and elec-
tronic media, 89 percent of students said that 100 percent of their needs were ful-
filled through print media. Only 6 percent responded that electronic media was
marginally useful, and 5 percent said that its value was negligible. The general
view of the students was that the so-called electronic media components were more
isolated parts than an integrated whole. The students strongly advocated the need
to integrate printed and electronic media components and to strive for a more syn-
ergistic approach to the learning process. They also said that visiting the study
centers in order to listen to audiocassettes or to view videotapes on days other than
counseling dates was a heavy burden.

Bahack (1997) analyzed the expectations of Israeli teachers and students before
moving from traditional printed learning materials toward television and satellite
classes. Of 300 teachers interviewed for a first survey, 82 percent indicated a prefer-
ce to enroll to a tele-course offering printed material as well as the televised pro-
gram, and considered printed material to be the most important component of the
course. A second survey involved 151 Open University of Israel students attending
four mathematics courses that offered instructional meetings via satellite as part of
the courses. The survey revealed that the students were highly satisfied with the
new technology, but 75 percent said they would prefer to enroll in a course that
included traditional class meetings as well as satellite classes.

3.2.2. Monitoring Staff Quality

Staff quality is a key variable in any DDL initiative, whether it is an academic pro-
gram or a short-term training activity. Important evaluation questions are:

- To what extent does staff development build on partnerships and collaboration
  with other institutes and organizations?
- Does staff development follow a multitude of paths to develop the skills re-
  quired for DDL over the short and long term, or is it a single-shot initiative?

Several internal evaluations address staff quality. Aderinoye (1997) presents a
historical analysis of the staff quality of distance learning institutions in Nigeria.
Inadequacies observed in human resources led the researcher to define ways of meeting the training needs of distance learning processes in Nigeria. He also proposed a staff development model that includes special training sessions, self-study packages, professional qualification programs at a distance or on-site, fellowships, study tours, visitation programs, regional workshops with other distance learning institutions, and the encouragement of a national and regional professional distance learning organization.

Evaluations of staff quality are also conducted externally. Mayer and Roy (1997) describe a Canadian-Chinese collaborative project that helped to set up distance learning programs in western China, targeting remote and marginal populations. The project focused on an external analysis of staff expertise and consequently the empowering of a Chinese distance learning center. The approach adopted consisted of sending introductory packages to trainers, visits to China and Canada by trainers, and preparation. The Canadians resisted the tendency to utilize a Canadian model, and helped the Chinese develop their own model by:

- Providing training in course design and development, including minority and gender-sensitive student support and tutoring
- Training Chinese personnel in the philosophy and methods of distance learning
- Training “trainers” who can then expand the Chinese base.

Staff expertise seems to be key to the successful startup of distance learning initiatives in developing countries. Chacon (1997), analyzing the growth of distance learning in Latin America, found training programs for systematic development of staff, focusing on distance learning and information and communication technologies, and demonstrated their efficacy.

In an international collaborative project, institutions in Brazil, the United Kingdom, and the United States designed a DDL package for teacher training in the field of environmental education, a topic of prime importance in developing countries (Faria and others 1997). Although the project is still being evaluated, the Internet-based course seems to have had a very positive impact (fax and voice facilities may have to be used in remote regions due to resource restrictions).

3.2.3. Conclusions

- The quality of DDL staff is being evaluated, both qualitatively and quantitatively.
- Staff training is being evaluated.
- There are numerous empirical studies of perceptions, opinions, and attitudes of students and clients regarding distance learning.
- When digitization is not part of an integral, holistic approach to distance learning, student and client attitudes and perceptions are somewhat negative.

1. Although this section is oriented toward internal evaluations, instead of drafting a new section focused only on external evaluations of staff (quality), we thought it wiser to add the few external evaluations of this variable here.
3.2.4. Recommendations

DDL initiatives should:

- Monitor the knowledge students have about technology resources in new distance learning deployments.
- Monitor the level of integration of the different delivery media used in the deployments.
- Observe the relative importance students attach to different delivery media.

With regard to the variable “staff,” the findings suggest:

- Following a multitude of paths to develop the skills required in staff development.
- Focusing on both short- and long-term projects.

3.3. External Evaluation Studies

Given the emphasis on local ownership of activities facilitated by the World Bank and WBI, the national and local (socio-cultural) environment is an important characteristic of DDL evaluations. Cost-benefit studies, DDL feasibility evaluations, and distance learning network and partnership evaluations were also reviewed.

3.3.1. The Socio-cultural Environment

Analysis of the socio-cultural environment includes linking various societal institutions to combine forces in a DDL context. Wang (1997) presents a critical analysis
of community antenna television, used to reach adult learners in a community in Taiwan (China). She finds that a more powerful system could emerge by building “learning communities”—combining television delivery with the efforts of schools, societal groups, and professional organizations. The community antenna television program could include system owners, channel owners, and program producers. Community groups could include for-profit and nonprofit organizations. Social education institutions are government departments that are partly responsible for adults’ continuing education in Taiwan (China), including museums, cultural centers, libraries, and social education institutions. Community adult education institutions are varied professional organizations that are in the process of becoming major providers of adult education.

Takwale (1997) shows that DDL initiatives have to be embedded in a societal environment that combines the home, the workplace, regional resource centers, and community learning centers. He describes how India’s national and state open universities and correspondence course institutions are being organized under the auspices of the Distance Learning Council into an Open Educational Network (OPENET) by establishing:

- A network of physical and intellectual resources through study centers spread throughout the country
- A teleconferencing and broadcasting network of presentation and teaching end rooms and receiving end rooms at regional study centers, ultimately made accessible to learners at home
- An information communication network (e-mail, nicnet, Inet, Internet) for communicating information and academic services (figure 1).

Figure 1. Student-centric Networked System of Education (OPENET–Open Education Network)
The second and third components may be integrated. With a flexible and modular approach and the partnership of conventional and unconventional providers of education, the OPENET offers a unique networked system of education.

Such developments are important for the World Bank and WBI because they can lay the groundwork on which local distance training activities (organized or facilitated by the Bank) can be added.

For DDL initiatives to be accepted by the socio-cultural environment, including local communities, they must be linked to existing communication and interaction channels. In describing the approach adopted in Nigeria to use radio in distance learning, Tahir and Umar (1998) stress the fact that evaluation was integral to the open broadcasting strategy to attain objectives established by the National Commission for Nomadic Education. Data collected from interviews with community leaders and listeners indicate that the strategy was received positively and that children’s school attendance increased as a result of listening to broadcasts and community discussions.

In 1997 the Commonwealth of Learning reviewed studies to detect barriers to the diffusion and integration of education technology in distance learning in developing countries (McWilliams and Khan 1997). First, DDL initiatives face the challenge of reacting and planning within a broader national context over which the education sector has little influence or control. Although an education institution may be aware of the advantages of incorporating technologies into its delivery and support services, the absence of an adequate national policy framework and infrastructure militates against these intentions. A second barrier is the human element. The adoption of technologies in distance learning can be hindered by limited awareness of the potential of technology, negative attitudes toward change generally and toward technology in particular, and low managerial capacity and skills for applying technology within education institutions and related organizations. Social, cultural, and political climates are a third barrier to the adoption and diffusion of technology. Several authors cite the need to use appropriate technology and develop indigenous technology. In sum, developing institutional, human, and technical capacities is essential for the effective diffusion and integration of digital education technologies.
3.3.2. **Cost-benefit Analysis**

Cost-benefit analysis is related to the economics of education and relies heavily on business models:

- Pay-back and break even
- Return on investment
- Net present value (investment required to gain a certain return in the future)
- Internal rate of return.²

Given that the information and communication technologies used in DDL efforts often require large investments, we expected to find many cost-benefit analyses. Instead we found only a few, mostly dealing with noncredited (company-linked) learning and training activities (see section 1.4). Researchers, auditors, and financial controllers informed³ us that because their superiors were not particularly interested in cost-benefit analyses, they rarely received approval to initiate cost-benefit projects. Concerns about the return on investment did seem to hinder institutions’ commitments to using new DDL products in competitive markets. In these cases new products were considered future investments—a way to market the product and institution. These examples suggest that evaluation processes are embedded in an evaluation infrastructure that can inhibit progress (see section 4).

A variety of cost-benefit models are available in the field of distance learning. Keegan (1990) provides an overview and refers to the well-established model of Rumble.

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2. We also recommend the reader to consult the internal documentation of the World Bank on the issue of cost-benefit analysis. We did not incorporate the vast body of experience available within the World Bank in this report; this would have looked redundant.

3. Part of this information was passed on to one of us in a confidential way.
A budgeting formula for distance learning is also well established:

\[ T = F + aL + bD + gC + xS \]

where \( T \) is total recurrent costs, \( F \) is fixed recurrent costs, \( a \) is average cost of a local center, \( L \) is number of local study centers, \( b \) is average cost to produce a course, \( D \) is number of courses in development, \( g \) is average cost of presentation of a course, \( C \) is number of courses in presentation, \( x \) is average cost per student, and \( S \) is number of students.

Bates (1995) presents a comparable formula that expresses costs as “dollar cost per student contact hour.” In his overview he discusses cost factors in relation to most of the technologies relevant to DDL. However, the overview has two major problems: only financial costs and benefits are considered, and information is based exclusively on experiences in industrial countries (especially the United Kingdom).

Dillemans and others (1998:100–101) refers to several cost-effectiveness studies of information and communication technologies (ICT) within the education sector. Citing Herman (1994), he comments that “comparative studies of ICT-based education versus traditional schooling often end in conclusions that there is no significant difference and no measurable effect.” However, Dillemans believes that “the fault for these results lies not with the technology-based innovation but rather with the assessment methodologies used and the nature of the effects measured.” Citing Kulik (1994) a different picture emerges: “Meta-analyses have demonstrated repeatedly that ICT usually has positive effects on student learning.” In addition, a study conducted by Davis (1996) found that “ISDN can be cost-effective for secondary schools and universities, provided the institutions have an ethos that welcomes innovation with flexible learning and new technology” (Dillemans and others 1998:101).

In developing countries there is some evidence that distance learning is cost-effective. After studying the approach adopted by Renselaer Polytechnic, California State University and Old Dominion, Jewett (1997) concluded that:

- Mediated instruction can generate benefits at least equivalent to classroom instruction.
- With sufficient enrollments, mediated instruction is less expensive.
- With sufficient enrollment, the same benefits can be realized at lower costs.

With support from the Asian Development Bank, Dhanarajan and others (1995) conducted an overview of studies of cost-benefit analysis. A large number of the studies examined emerging electronic universities, personal computing and television universities.

For instance, Yenbamrung (1995) compared online courses with a face to face alternative. His return-on-investment analysis helped identify key student variables that influence student cost-effectiveness (such as the study loan and the use of interactive video instruction). The net present value analysis, taking into account time as a value, revealed that interactive video instruction had a higher net present value. The internal rate of return-analysis showed that the off-campus mode was superior because students could work, avoid study loans, and pay reduced tuition
and fees. Yenbamrung stresses that the projects look promising but are snapshots and do not yet show a longitudinal picture.

Kirkwood and Ismail (1995) revealed that the use of DDL might transfer the cost of learning to the home learning environment, resulting in higher cost-effectiveness for institutions but not for students or clients. Although students could borrow computers from the institution (redistributing the cost), there remained hidden costs.

Another project of interest occurred at the University of British Columbia, where Bartolic (1998) applied a cost-benefit analysis to online courses set up in Canada. Comparing the results with a face to face setting that builds on printed materials, she found that the online approach was cheaper than a traditional design, production and delivery approach. Her study also revealed:

- Different stakeholders have different perspectives on costs and benefits. For example, the university believed that professors cost more when they are involved in face to face teaching and training than when they are participating in the online variant.
- Calculation models have to be checked. Institutions seem to be blind to certain distance learning costs and benefits.

A number of studies indicate that in general the cost per student is lower in DDL institutions than in conventional institutions. This is clearly the case for higher education in China, India, and Thailand (Ansari 1994; Xingfu 1994; Teswanitch 1994). But the cost-effectiveness in terms of cost per graduate or credit is lower than expected due to the low completion rate and high average length of study in DDL programs.

### 3.3.3. Feasibility Studies

- Internal evaluation studies: Performance data
- Internal studies: Attitudes and perceptions
- External evaluation studies
- Stakeholder approach
- Other approaches and methods

- Socio-cultural environment
- Cost-benefit analysis
- Feasibility studies
- Networks and network analysis
Working with the Indira Gandhi National Open University and the Indian Space Research Organization, Veena and Phalachandra (1997) developed a primary teacher training project in India based on interactive television. The project was designed to study the feasibility of using interactive video technology (one-way video and two-way audio) as an alternative to the cascade approach to train relatively large numbers of teachers, assembled in different centers with the help of a few experts. By the cascade approach the following is meant. A core group of teachers is trained first. They in turn train another group of teachers. After a period, a growing number of teachers take up the role of trainer and disseminate their expertise.

In a 1996 run of the project, 847 teachers in 20 centers participated in a seven-day program, supported by local on-site facilitators. The evaluation made use of questionnaires, observations and posttest analysis. The results were very positive:

- The methodology used in the experiment was found to be better than the conventional method.
- Telephone communication proved to be very useful.
- Answers given by the experts were found to be satisfactory, relevant, and useful.
- The program was considered by the panelists and moderator to be of a good standard.
- Better understanding of child-centered and activity-based teaching could be shown, and the significance of minimum levels of learning was emphasized.
- Teachers reported that the program was effective, created interest, built up their enthusiasm, improved their capabilities, and was superb.

The project shows the impact of inter-institutional collaboration, the importance of local facilitators and local ownership and the relevance of interactivity in the distance learning design.

The first distance learning study program in Slovenia was researched by Bregar and Zagmaister (1997). Before the program was launched, the University of Ljublana developed a large-scale evaluation program and ten initial courses. The learning materials were comprised of written materials, audiotapes, and computer programs.

The main variables studied were the distance learning course in general, study materials, tutors’ work, professors’ work, administrative staff’s work, student characteristics (demographic and other general data, study habits, conditions for study, social background), assessment procedures, financial matters, the DDL information system and facilities, and the organizational structure of DDL.

Information was collected through:

- Student questionnaires on enrollment and courses
- Meetings and discussions with students, management and counselors
- A workshop with professors and tutors
- A review written by an expert on distance learning study materials
- A peer review by two foreign distance learning experts
- Discussions with computer specialists and other staff
- A database of students’ exam scores.
3.3.4. Networks and Networks Analysis

Earlier we noted the importance of collaboration and partnering. What do evaluations say about these topics? Shahabudin (1997) describes an effort in Malaysia to pool a variety of resources to set up a distance learning postgraduate program in family medicine. A local university worked with the Ministry of Health and a number of other organizations:

- A policymaking body concerned with the academic program and accreditation
- The Commonwealth of Learning, which helped develop distance learning technology
- The World Health Organization, which assisted with program development and evaluation
- Telecoms Malaysia, which assisted with network installation and special tariffs.

The collaboration focused on setting rules and identifying roles; developing organizational support and linkages for program implementation; creating a learner support system; training supervisors; supervision, tutoring, tutoring and counseling; assessment and program evaluation.

The World Health Organization and Ministry of Health played a key role in program evaluation, periodically investigating the following variables:

- Recruitment and selection of students
- Quality of the family medicine curriculum
- Supervision and on-site activities in regional training centers
- Intersectoral collaboration
- Quality of supervisors and academic staff
• Impact of the family medicine training program
• Quality and development of the graduates
• Network of centers of excellence.

After assessing the strengths and weaknesses of the Virtual University for Mexico, Pérez (1997) concludes that DDL had been successful, given the increase in student enrollment, because it built up a new model of education grounded in the local culture. He calls this model “network education” to emphasize the interlinkage of networks. The 26-campus network is linked through satellite reception facilities for the two transmission sites. Reception centers are classrooms equipped with large monitors or projection screens, as well as computers directly connected to the remote interaction system based on Internet protocol.

Nti (1997) presents an overview of considerations when designing collaborative international DDL projects. She indicates that challenges facing educators in developing and delivering programs to international audiences arise mainly from:

• Cultural differences such as language differences, and differences in indigenous perceptions, attitudes, and beliefs
• Economic differences affecting tuition and technology acquisition costs
• Pedagogical and instructional differences (teaching styles and how learners process information)
• Administrative differences (registration of learners, accreditation, enrollment, and regulations)
• Technological differences (level and use of technology, learner responses to technologies).

Nti presents strategies for managing these differences—performing audience analyses; developing courses that take into account language, pictures and copyright differences; and selecting appropriate media, teaching strategies, and pedagogical approaches.

The establishment of international networks to support the local development of DDL can be construed by developing countries as a covert means of introducing neocolonialism. Roy (1997) indicates that Malaysia has been reluctant to set up partnerships with international organizations for this reason. Thus she presents small-scale examples in which the empowerment of local institutions and development of local expertise is the predominant approach to collaboration rather than the importation of industrial countries’ products. She also refers to the importance of international agencies acting as neutral bodies, referring to the Commonwealth of Learning.

Ramanujam (1997) presents material that is linked to the product importation issue in a review of DDL models in developing countries. Based on his analysis of initiatives in Latin America, Africa (Ethiopia, Zambia, Kenya) and Asia (Indonesia) he concludes that:

• Though difficult to develop, indigenous models for distance learning (for example, models based on oral culture) will have greater relevance and influence than copied or adapted models.
• The future of distance learning in developing countries depends more on the ability of distance teaching institutions to respond to the needs of learners at different levels and less on their success in catching up with their counterparts in the industrial world.

3.3.5. Conclusions

• The socio-cultural environment, on both the local and national levels, should be taken into account when performing evaluations.
• The socio-cultural environment is also an important consideration in the implementation of DDL initiatives in the workplace, regional centers, community centers, and the home.
• Few cost-benefit analyses focusing on DDL are available.
• There is some reluctance to conduct these types of analyses because stakeholders consider digitization a specific asset in competing with other organizations, which may make it difficult to have objective data on the costs and benefits of digitization. Still, cost-benefit analyses that have examined DDL are generally positive about this approach.
• With regard to feasibility evaluations, some examples use a multimethod approach.
• Networks and partnerships are important for developing DDL and are researched in several evaluations.
• In some studies the importance of pedagogical scenarios or learning models is mentioned, but those approaches require further evaluation.
• DDL models from industrial countries are imported cautiously into developing countries.

3.3.6. Recommendations

Recommendations with regard to the variable environment:

• Determine whether the environment of a DDL project offers opportunities to share resources such as libraries, community centers and the workplace.
• Seek partners that can strengthen initiatives.
• Analyze what communication channels and approaches are available to spread interest in DDL initiatives.
• Conduct research to define technologies appropriate for developing countries.
• Determine whether capacity building is necessary in the project environment (for example, at the institutional or community level).

Recommendations with regard to cost-benefit analysis:

• Define nonfinancial costs and benefits to be incorporated in the analysis (performance-driven benefits, including learning outcomes and levels of satisfaction), value driven benefits (access, flexibility, ease of use) and societal or value-added benefits (pollution reduction).
• Prepare an answer to questions regarding the extent to which variables in a cost-benefit analysis are derived from the specific DDL settings in developing countries.
• Base the analysis on data gathered over a sufficient period of time.
• Focus on the perspective of different stakeholders when calculating costs and benefits (for example, the institution and the client).
• Research the availability of an objective study on the success of calculation models.

Recommendations with regard to networks and network analysis:

• Delineate priorities in distance learning initiative partnerships (for example, for program design and development but not for the actual deployment).
• Involve partners with specific expertise (for example, a telecommunications partner for setting up communication provisions).
• Consider differences between national and international partners in a partnership (cultural, economic, pedagogical, administrative, and technological).
• Be aware of project features that might be interpreted as neocolonialism.

3.4. Evaluation Studies in which a Stakeholder Approach is used

A list of potential stakeholders can be viewed in two ways: as a list of potential target audiences to be involved in a DDL evaluation activity, or as a list of perspectives that define the orientation to be considered within the context of an evaluation (Table 7).
Silong (1998) explains how terms of the partnership between the Center for Extension and Continuing Education of the Universiti Pertanian Malaysia and a number of commercial partners were monitored and had to be reconsidered after the first stage of the program was completed.

Farnes and others (1994) conducted a study related to a new collaborative distance learning program in Hungary entitled “The Effective Manager,” involving printed materials, videocassettes, and audiocassettes. The study focused on performance indicators at levels of the individual client, organization, and society (for example, job changes and the number of course topics applying to management). Developers and researchers also focused on diffusion effects (transition toward a market economy) of the distance learning program. The results of the study refer primarily to the role played by the employer as a stakeholder in the program. It was found that to maximize the adoption and application of coursework, employers had to:

- Sponsor senior-level participation
- Promote frequent contact with one another
- Enable collective participation in the implementation of changes
- Encourage knowledge transfer to other employees
- Promote those who have taken the course.

Klimowicz (1998) of the National Center for Distance Education in Poland gives an example of a needs-analysis investigation—in the context of developing a complete new distance learning system for Poland—in which an analysis was conducted to determine the primary needs of specific social groups. He also compared this system to traditional education systems, which are reputed to not be able to meet such groups’ needs. The Polish study focused on residents of rural areas, disabled persons, the unemployed, and teachers. The study contributed to an existing database gathered with survey interviews and questionnaires, and helped clarify specific needs in terms of:

- Competencies that should be developed for these audiences
- Readiness and willingness to adopt distance learning
- Course topics to be covered for specific audiences

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Table 7. Significant Stakeholders in Evaluations of Digital Distance Learning

<table>
<thead>
<tr>
<th>External stakeholders</th>
<th>Internal stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Funding agencies (governmental, private)</td>
<td>• Students and clients</td>
</tr>
<tr>
<td>• Policymakers and decisionmakers (local and national authorities, religious authorities, civil society)</td>
<td>• Student and client peer groups</td>
</tr>
<tr>
<td>• Employers (specific or sector)</td>
<td>• Content specialists</td>
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<tr>
<td>• Partners in a partnership</td>
<td>• Tutors</td>
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<tr>
<td>• Representatives of other DDL initiatives</td>
<td>• Counselors</td>
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<tr>
<td>• Alumni</td>
<td>• Teachers or professors</td>
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<td></td>
<td>• (Head of) section/faculty</td>
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<tr>
<td></td>
<td>• (Head of) institution</td>
</tr>
<tr>
<td></td>
<td>• Administrators</td>
</tr>
</tbody>
</table>

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- 29 -
• Preferred didactic methods and requirements
• Constraints for implementing a distance learning system from the perspective of the user (money, motivation, technical background).

Similarly, Georgiev and others (1998) examined the education needs of six groups of potential distance learning customers: school dropouts, external students, part-time and unemployed workers, private and state-sponsored learners, professionals seeking regular updates, and adults seeking training for career changes or personal development. Universities and community-based organizations were involved in a study that indicated that external groups, part-time and unemployed workers, and private and state-sponsored learners should be the focus of distance learning initiatives.

Bottomley and Calvert (1995) surveyed stakeholder (students and administrators) appreciation of potential services, including e-mail, computer conferencing, and online library access. From the public policy perspective, digital features received high ratings. Students valued other services, though, such as telephone services providing group and individual access. The varied perspectives brought into question premature government or institutional investment in computer networks. The researchers discuss problems, however, with this kind of data gathering, noting that the survey design was a challenge because it was not certain that respondents would have direct experience with the full range of technologies.

In more general terms, it may not be particularly useful to conduct hypothetical surveys with stakeholders who have limited experience with new distance learning media.

3.4.1. Conclusions

• The stakeholder perspective must be considered.
• Stakeholders may hold opinions, attitudes, and perceptions about information and communication technologies despite limited experience with new media. Although the hypothetical question methodology is useful in interviewing stakeholders, this issue must be taken into account.

3.4.2. Recommendations

• Identify stakeholders at a variety of levels (target audience, institution, institutional network, national and international) and along a variety of dimensions (educational, economic, socio-cultural).
• Identify congruencies and conflicts in the interests of the stakeholders and discuss them beforehand. Check the level of flexibility in the project to deal with the differing interests of stakeholders.
• Monitor the involvement of stakeholders, and consider this a research or evaluation question in the DDL initiative.
• Consider who the primary audience should be for a DDL initiative, the specific needs of identified target groups, didactic methods and pedagogical scenarios that are in synch with target groups, target group expectations regarding services
that will be provided, and target group expectations regarding technologies that
will be used, assuming that a list of stakeholders is available.

### 3.5. Other Approaches and Methods

Here we will assess three other approaches to evaluation:

- Media selection and usage
- Total quality management and ISO certification
- Social-psychological studies focusing on computer-mediated communication.

#### 3.5.1. Evaluating Media Selection and Usage

In industrial countries a number of initiatives have contributed to the development
of decision models that support evaluations of media selection decisions. An ex-
ample can be found in the work of the Open Learning Technology Corporation
Limited (1997) which created a model for making technology decisions pertaining
to open and flexible learning. Cost-benefit analyses of this model are enhanced by
the attachment of values to dimensions and variables in terms of money or socio-
cultural considerations. Appendix 2 in section 8 provides a more detailed media
selection decision model.

As indicated earlier in the discussion of needs analysis, such choices must be
tailored to the cultural and societal setting. Kamau (1997) researched culturally
adequate media to support distance learning literacy programs in Kenya. She pro-
poses the following options:
• Newspapers, wall newspapers, and magazines
• Libraries for new readers, mobile exhibitions, and museums
• Programs and other informal courses of a vocational and general character for out-of-school youth
• Distance learning courses for local study action groups and individuals
• Traditional folk media
• Sports, games, and physical culture
• Radio, television, video, and movies.

3.5.2. Total Quality Management and ISO Certification

Kishor and Saxena (1997) develop a model of self-evaluation at the institutional level and apply it to their own institution—the Indira Gandhi National Open University—in view of overall quality control. Their distance learning systems incorporate certain features of DDL, including television, radio and teleconferencing, and computers (Table 8).

Madan (1997) indicates that until recently systematic research has been lacking on total quality management in open and distance learning systems—despite the willingness of distance learning researchers to subject their work to scrutiny. Madan believes that part of the problem is related to a lack of systematic interest in conducting this research.

Obtaining an ISO certification is often a component of total quality management, and several distance learning institutions have sought ISO certification. One is Hungary’s SZAMALK (Számítógépes Távoktatási: Computer-based Distance Education). Zárda (1998) presents an overview of the activities conducted over two
years to acquire the certification in 1997. The following activities were the most critical in the ISO certification process:

- Regulating the curriculum and teaching the material development process
- The curriculum and teaching material approval system
- The process of recording external trainers
- Qualifying suppliers of materials and services
- Qualifying internal trainers.

In the context of the Socrates Open and Distance Learning Program of the European Commission, the CALIBER-NET project focuses on quality in European open and distance learning. The project resulted in the creation of a distance learning quality development guide (Twining and Davies 1998). The guide emphasizes the importance of gathering and designing clear standards and checking who sets the standards for which criteria (to avoid, for example, unbalanced standards for face to face and DDL in terms of teacher costs). This should be done before starting the evaluation. The guide also points to the importance of defining an evaluation system—defining objectives, approaches, and organization.

Maimela (1997) reviewed the quality assurance mechanisms at the University of South Africa, which included external examinations or program accreditation, external review of the institution based on self-evaluation, peer evaluation of other institutions, and study visits. Although the approach looks systematic, Maimela advises continuous control of the evaluation cycle and strongly recommends the involvement of external resources in this process.

<table>
<thead>
<tr>
<th>Evaluation aspect</th>
<th>Elaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access</td>
<td>• Refers not only to resource availability but also to equality of education opportunities, so that education becomes a liberating and democratizing force</td>
</tr>
</tbody>
</table>
| Programs and courses      | • Logic of the courses: To what extent courses are logical, relevant and suited to the needs of distant learners, such as in areas where the demand for skilled workers outstrips the supply  
                           | • Self-instructional materials (appreciation and success in other institutions)  
                           | • Face value of the course materials: the technical quality of print, audio, and video materials  
                           | • Delivery of products: quality of study centers (buildings and mobile centers). The use of interactive technologies, such as teleconferencing, should also be considered in this context |
| Learner outcomes          | • Exit standards at the learner level (scores, completion, dropout rate) and employer level                                              |
| Effectiveness and efficiency | • Cost and cost-effectiveness of programs                                                                                               |

Source: Kishor and Saxena (1997).
3.5.3. Computer Mediated Communication and Virtual Teams: Some Psychological Studies

Organizations are increasingly developing “virtual” teams that do not live in close proximity but can work together, deliver services, and produce goods in a coordinated effort. This is especially the case with knowledge workers, where the emphasis lies in the free exchange of information in order to reach the best possible policy, opinion, and practice decisions. The primary issue with such endeavors concerns “knowledge management” through computer-mediated communication. For the World Bank and WBI computer-mediated communication can be especially valuable for transferring knowledge. With its World Bank Learning Network—including virtual classrooms, teamwork in policy seminars and workshops, and seminars for policymakers, parliamentarians, opinion makers, and practitioners—the World Bank can bridge large distances between participants with computer-mediated communication.

The shift from traditional, face to face teams to virtual teams is the primary reason to look into behavioral studies of this form of communication. Does computer-mediated communication achieve similar or higher levels of performance and individual and team productivity? What are the perceptions of people who do not interact face to face but rather through computer-mediated communication, and what impact has the “cyber revolution” had on organizational behavior?

While abundant research has been carried out on the effectiveness of face to face processes, such research does not yet exist for virtual teams. Computer-mediated communication is a socio-technical system that supports communication-oriented activities through computer-driven collaborative activities. It enables organizations to work together in situations that are not constrained by real time and geographic considerations. Computer-mediated communication can thereby contribute to the efficiency of synchronous meetings, including face to face meetings, telephone calls,
desktop conferencing, and Web-based chat rooms. It is estimated that managers spend 60 percent of their communication time in such meetings (Panko 1992), which depend on the direct availability of participants. Moreover, such meetings take place in an environment less structured than computer-mediated communication, in which it is can be challenging to fully explore and understand the ideas, reasons, and motivations behind information and decisions. Participants in computer-mediated communication can contemplate messages and return a reply whenever they like. Such meetings are often more structured, and usually based on documents, exchanged through participants. Asynchronous communication usually also takes longer than synchronous meetings.

Behavioral investigations of virtual teams and computer-mediated communication fall into two main fields.

• The first concerns research into the effectiveness of virtual teams and computer-mediated communication. The studies concern how virtual teams obtain and share important information and how they reach consensus and decisions. Another issue is how to control and measure the productivity of computer-mediated communication team and team member productivity.

• The second field concerns research into group processes within the teams. How does the loss of physical aspects of communications (such as social cues) affect the group and its members? Can these teams develop the necessary relational links to reach a similar level of social performance?

In both fields, research, like the medium, is relatively new. Both positive and negative outcomes have been observed, but one major result is that computer-mediated communication is a promising technology that enables teams to derive greater benefits than face to face teams. Organizations using computer-mediated meetings have claimed that the computer has allowed tremendous increases in the productivity of meetings (Bulkeley 1992). In addition, the quality of work can be improved by lessening status distinctions (Dipboye and others 1994).

Although the lessening of status distinctions can boost a group’s creativity, the anonymity that leads to this benefit can also create problems. The lack of nonverbal
cues makes it harder for participants to determine how others feel about the issues under discussion. As a result, individuals in computer-mediated meetings take longer to agree on issues and are less satisfied with the process (Dipboye and others 1994). Because it is harder to exchange information, virtual teams tend to be more task-oriented and exchange less emotional information, slowing the development of relational links (Childambaram 1996). Researchers have associated strong relational links with many positive outcomes, including enhanced creativity and motivation, increased morale, better decisions, and fewer process losses (Walther and Burgoon 1992).

Still, researchers have claimed that the lack of social presence and social cues can increase the effectiveness of virtual teams. Task orientation appears to increase, and workers who are not socially adept are more productive. Variables such as status seeking and status incongruence appear to be less important in virtual teams than in face-to-face circumstances (Davies 1998; Kiesler, Siegel, and McGuire 1984) conducted several problem-solving experiments and concluded that groups that use computer-mediated communication take longer to reach consensus, participate more equally, and show more willingness to arrive at conclusions that differed from their initial proposals. Sproull and Kiesler (1991) suggest that e-mail enables people who are peripheral in organizations to become more visible.

To what extent can virtual teams develop processes that are directly oriented toward the well-being of the group, individually and collectively? Childambaram (1996) argues that, with time, computer-mediated groups can overcome the limitations of the media and achieve the same level of relational links and, therefore, the same level of performance as face-to-face groups.

These findings suggest that the coaching of virtual teams may become an important issue in future research. Though little such research has been conducted to date, interesting studies have been conducted in the field of educational psychology on teaching and training activities in a computer-mediated environment and on self-directed learning. As with virtual teams, coaching of students is realized through electronic support mechanisms like the “intelligent tutor” (McManus and Aiken 1995). As students acquire critical thinking skills, participation in a community of self-directed learners is appropriate—and computer-mediated communication can facilitate this process. But such a transition in student learning can take place only when the teaching and learning styles of teachers and students are transformed from information dissemination to critical inquiry and from instructor-dominated to collaborative learning (Seaton 1993).

Jarvis (1995) considers leadership and coaching as essential conditions for realizing a socio-emotional climate in virtual teams, which is important for knowledge transfer. According to Jarvis, the teacher should try to establish a climate that encourages relationships. In this situation the manner in which teachers interact with learners is probably more important than the actual teaching methods employed.

Wilson and Whitelock (1998) stress, on the basis of longitudinal studies, the central characteristics of what a computer-mediated instructor should do to facilitate learning: facilitate access to needed technologies, create a sense of engagement, foster the sharing of information, and promote individual gratification.
3.5.4. Conclusions

- It is important to consider media selection when evaluating DDL.
- The success of DDL depends on the cultural acceptability of the media selected.
- Total quality management and ISO certification are possible for DDL.
- DDL introduces a new way of interacting: computer-mediated communication. Transferring knowledge about communication from face to face to computer-mediated environments is not straightforward.

3.5.4. Recommendations

- Evaluate the fitness of media for specific cultural settings.
- Ensure the validity and reliability of data used in a total quality management process.
- Establish monitoring activities of interaction processes in computer-mediated settings.
4
Blind Spots, Forgotten Variables, the Importance of an Evaluation Infrastructure, and Promising Directions

4.1. Blind Spots and Forgotten Variables

Evaluations of DDL initiatives inevitably suffer from blind spots and forgotten variables. The following comments focus on the relevance of such oversights from the perspective of the World Bank and WBI:

• We did not find evaluations that focused on reconstructing and assessing the underlying program logic of distance learning activities in general, or digitized activities in particular. Evaluations that referred to the cultural acceptability of models and media for DDL came closest, but no explicit methodology was used to reconstruct and assess those profiles (GAO 1991; Leeuw 1991 for more information on such a methodology). Evaluations articulating and assessing underlying pedagogical scenarios and learning or instructional models were also lacking, as were empirical studies assessing the quality of those models. Reconstructing and assessing the underlying program or pedagogical logic is important because it gives evaluators and decisionmakers insight into social and behavioral premises or mechanisms that underlie activities. In particular, reconstructing and assessing the underlying logic of an activity is important for obtaining information about future opportunities for program activities. The more sound are the premises on which an activity is based, the greater is the chance that the activities will succeed.

• McNeil (1998) summarizes attitudes of leading educators regarding the Internet as a tool for distance learning. She found positive assessments but also referred to the “butterfly defect.” Given apparent differences in values attached to the Internet, articulating and evaluating social, cognitive, and behavioral assumptions underlying the Internet as an education tool are strongly recommended.

• Information on the impact DDL evaluations have had on decisionmakers, teachers, and trainers is hard to find. We consider this a second major blind spot.

• Though information and communication technologies open up new ways for data collection, we did not come across many studies making use of these possibilities.

• Though networking and partnering are considered important, evaluations of these variables are limited.

In the evaluations we referred to, a traditional approach to networks is used which focuses on institutional collaboration. We did not run into studies in which networks
were empirically charted (over time), nor did we find studies which answer the question how networks can be ‘managed.’ Information on types of networks, on the importance of mechanisms like ‘trust,’ ‘social capital,’ and ‘commitment’ within networks is lacking too. It is the overarching mechanism of social capital that makes networks ‘work.’ In order to understand and assess how this mechanism works, it is necessary to look into this phenomenon more carefully. While the methodology of collecting social capital data and charting networks has expanded rapidly over the last 15 years, it looks as if this development has not been acknowledged by the community of evaluators in the field of DDL. In our opinion this again is an important blind spot.

- In several evaluations the valid and reliable data needed for a cost-benefit analysis do not exist. This may be attributable to political or economic reasons.
- There are few evaluations of short-term teaching and training programs; most looked into programs that focused on credits and academic degrees. Given the focus of the World Bank and WBI on short-term DDL, this is another important blind spot in the research.
- The overall quality of DDL evaluations is questionable. Evaluation is generally a low priority of the overall training or learning activity. Evaluations are often academic exercises that are not natural components of digitalization initiatives. Evaluation techniques are limited, marred by methodological shortcomings (lack of control, inferences, sampling errors) and restricted to descriptive statistics and analysis. Finally, few evaluations are a recurrent activity in the setup and control of initiatives. Most are one-time efforts.

4.2. Building Evaluation Infrastructure and Evaluation Capacity

Given these blind spots and forgotten variables, it is important to develop an evaluation infrastructure or capability when assessing DDL activities. We describe these concepts and their importance below. We also identify the types of organizations that should build an evaluation infrastructure into DDL programs.

Evaluation capacity building focuses on institutional arrangements and ways to safeguard evaluations to ensure that they are:

- Conducted and reported in a timely fashion
- Conducted using state-of-the-art theoretical and methodological standards (including a focus on reconstructing and assessing the underlying program’s logic and pedagogical models)
- Conducted by qualified personnel
- Managed properly
- Given sufficient funds for independent data collection and analysis

1. Ucinet (IV) methodology and Krackplot-charting programs are widely used elsewhere (Bulder et al 1996; Noria and Eccles 1995; Flap, Bulder, and Volker 1998).
• Conducted with a focus on utilization and organizational learning
• Conducted in a transparent and accountable way
• Focused on variables that are relevant for decisionmakers
• Conducted in a systematic rather than ad hoc fashion.

Evaluation capacity building is considered important by the World Bank, many audit offices, professional evaluators and their societies, and agencies focused on sound financial management and budgeting (ministries of finance, internal and external audit offices. McKay (1998:11) lists the following factors as crucial to the success of such efforts:

• The existence of a “champion agency” supporting, encouraging, and pushing the development of an evaluation system.
• Sustained commitment—an evaluation system cannot be developed overnight.
• A tailored rather than one-size-fits-all approach.
• Incentives that ensure that an evaluation system is developed and that evaluation findings are used.

Several open or distance universities practicing DDL have developed and implemented evaluation infrastructures. One reason is that these institutions were established at a time when evaluation and auditing were considered priorities, unlike the experience of traditional universities. Moreover, distance learning institutes are compelled to collect evaluation data because they usually do not have students and clients present; the presence of students and teachers often leads decision-makers (and teachers, tutors, instructors, and professors) to assume that abundant evaluation data are available.

We strongly advise the World Bank and WBI to invest in the development of an evaluation infrastructure in the countries and organizations they work with. EDI’s evaluation unit and the Bank’s Operations Evaluation Department can serve as models. If organizations working in the field of DDL are too small to develop an evaluation infrastructure of their own, we recommend the retention of evaluation brokers who can coordinate activities between smaller organizations.

4.3. Promising Directions

The following activities show promise:

• Performance monitoring using facilities offered by digital developments for data collection and analysis. The reason—faster feedback from decision-makers, other

2. There are also negative (side)effects reported in the literature when there is ‘too much’ of an evaluation infrastructure. Examples are ‘analysis paralysis,’ ‘manualization (everything has to be evaluated primarily for the sake of the evaluator and according to ‘manuals’) and the performance paradox (organizations that monitor and evaluate are not necessarily the most efficient and effective organizations). See Leeuw (1996a; 1998) for a discussion.
users and the general public on the pros and cons of performance data. Such monitoring may also ease the performance paradox (that is, when performance indicators fail to measure real performance).

- Enhancing knowledge of the impact of computer-mediated communication. The reason—the potential of computer-mediated communication provides new ways for involving large and varying numbers of stakeholders in the evaluation process. In addition to building on information obtained through direct (synchronous or asynchronous) interaction, there are additional information-gathering possibilities, such as background monitoring and logging of data usage and interaction patterns. Computer-mediated communication systems can document contact-to-contact information, kinds of data accessed, peak interaction periods, individuals and groups heavily involved in activities (creaming) or minimally involved (social marginalization), and infrastructure performance (peak usage, system failures). Data obtained from computer-mediated interaction are also promising because interactions are always documented and retrievable, and because evaluation feedback can be merged in the computer-mediated activities and analyzed separately.

- Development of a system-level evaluation. The reason—there are interesting examples of situations where a systems approach to evaluation has been adopted. Here evaluators were trying to map the full complexity of DDL environments: the variety of stakeholders, interrelations with cultural and socio-economic parameters, number of variables playing a role, and the fact that a long-term view of the processes and their societal impact was sometimes acknowledged. Such a systems approach is clearly in line with evaluation capacity building discussed above.
This section consolidates major conclusions and recommendations presented in this report.

### Internal Evaluation Studies based on the Analysis of Performance

<table>
<thead>
<tr>
<th>Conclusions</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Evaluations of distance learning focus on the opportunities information and communication technology offer for data collection.</td>
<td>• When establishing DDL initiatives, specific performance indicators should be established when information and communication technology is a central characteristic of distance learning activities.</td>
</tr>
<tr>
<td>• Performance indicators assessing distance learning activities have been developed and are available, and can reveal valuable findings (for example, on the difference in coverage of distance learning between geographic areas).</td>
<td>• It is important to assess what has been done with information resulting from performance indicators—that is, the extent to which distance education programs have been modified because of this type of information.</td>
</tr>
<tr>
<td>• Distance learning performance indicators can be culturally incorrect.</td>
<td></td>
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<tr>
<td>• Research literature on performance indicators did not focus specifically on DDL.</td>
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</table>

### Internal Evaluation Monitoring Attitudes and Perceptions as well as Staff Quality

<table>
<thead>
<tr>
<th>Conclusions</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Staff quality is being evaluated both qualitatively and quantitatively.</td>
<td>DDL initiatives should:</td>
</tr>
<tr>
<td>• Staff training is being evaluated.</td>
<td>• Monitor the knowledge students and clients have about particular provisions in the DDL setting.</td>
</tr>
<tr>
<td>• Research includes many examples of empirical studies on perceptions, opinions, and attitudes of students and clients regarding forms and cases of distance learning.</td>
<td>• Monitor the level of integration of the different delivery media used in the setting.</td>
</tr>
<tr>
<td>• When digitization is not part of an integral, holistic approach to distance learning, attitudes tend to be negative.</td>
<td>• Assess the importance students attach to different delivery media.</td>
</tr>
<tr>
<td></td>
<td>With regard to the variable staff, findings suggest:</td>
</tr>
<tr>
<td></td>
<td>• Following a multitude of paths to develop staff development skills</td>
</tr>
<tr>
<td></td>
<td>• Focusing on both short- and long-term projects.</td>
</tr>
</tbody>
</table>
### External Evaluation Studies

**Conclusions**

- The socio-cultural environment should be taken into account when performing evaluations at both the local and national levels.
- The foregoing is true for the implementation of DDL initiatives in the workplace, regional centers, community centers, and the home.
- Few cost-benefit analyses focused on DDL are available.
- Because stakeholders consider digitization a competitive asset with respect to other organizations, there may be reluctance to conduct external evaluations, which may make it difficult to obtain objective data on digitization costs and benefits.
- Cost-benefit analyses that have been conducted on DDL are generally positive.
- Several feasibility evaluations used multimethod approaches.
- Networks and partnerships are important for developing DDL and are researched in several evaluations.
- Importing DDL models into developing countries from industrial countries is warily received.

**Recommendations**

<table>
<thead>
<tr>
<th>Variable environment recommendations:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Investigate the potential of DDL project opportunities to share resources such as libraries, community centers, and the workplace.</td>
</tr>
<tr>
<td>- Seek partners to strengthen DDL initiatives.</td>
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<tr>
<td>- Analyze communication channels and approaches to spread interest in the DDL initiative.</td>
</tr>
<tr>
<td>- Define appropriate technologies for developing countries.</td>
</tr>
<tr>
<td>- Investigate whether capacity building is necessary in the project environment.</td>
</tr>
</tbody>
</table>

**Cost-benefit analysis recommendations:**

- Define nonfinancial benefits to be incorporated in analyses—performance-driven benefits (learning outcomes and level of satisfaction), value-driven benefits (access, flexibility, ease of use), and societal or value-added benefits (pollution reduction).
- Evaluate the extent to which the variables in cost-benefit analyses are derived from specific DDL settings in developing countries.
- Base analyses on data gathered over a sufficient period of time.
- Consider stakeholders’ perspectives in calculating costs and benefits.
- Conduct objective analyses of calculation models used.

**Recommendations with regard to network and network analysis:**

- Delineate preferred roles in a DDL initiative partnership—for example, for design and development of a program but not for actual deployment.
- Involve partners with specific expertise.
- Consider differences between partners, national and international, in a partnership (cultural, economic, pedagogical, administrative, technological).
- Be aware of project aspects that might be interpreted as neocolonialism.
Evaluation Studies in which a Stakeholder Approach is used

<table>
<thead>
<tr>
<th>Conclusions</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Consideration of the stakeholder perspective is important.</td>
<td>• Identify stakeholders at a variety of levels (target audience, institution,</td>
</tr>
<tr>
<td>• Stakeholders may have opinions, attitudes, and perceptions about</td>
<td>institutional network, national and international) and dimensions (educational,</td>
</tr>
<tr>
<td>information and communication technologies and DDL despite lacking</td>
<td>economical, societal and cultural).</td>
</tr>
<tr>
<td>hands-on experience, but their views must be considered in evaluations.</td>
<td>• Identify congruencies and conflicts in the interests of the stakeholders and</td>
</tr>
<tr>
<td>To this end, the hypothetical question methodology can be useful.</td>
<td>discuss them beforehand. Determine the level of flexibility in the project to</td>
</tr>
<tr>
<td>• Monitor the involvement of stakeholders. Consider this as a research and</td>
<td>deal with differing interests of stakeholders and partners.</td>
</tr>
<tr>
<td>evaluation question in a DDL initiative.</td>
<td>• Conduct monitoring and coaching activities for interaction processes in</td>
</tr>
<tr>
<td>Given the availability of a list of stakeholders, important issues to</td>
<td>computer-mediated settings.</td>
</tr>
<tr>
<td>consider include determining if distance learning is appealing, determining</td>
<td>• Total quality management of DDL is possible: overall quality management and</td>
</tr>
<tr>
<td>who the primary audience should be for a DDL initiative, determining the</td>
<td>control programs have been evaluated, as have ISO certification programs.</td>
</tr>
<tr>
<td>needs of identified target groups, identifying didactic methods that are</td>
<td>• DDL introduces a new way of interacting: computer-mediated communication.</td>
</tr>
<tr>
<td>consistent with the target groups, identifying target group expectations</td>
<td>Transferring face to face communication to computer-mediated environments is</td>
</tr>
<tr>
<td>about services that will be provided and determining target group</td>
<td>not a straightforward task.</td>
</tr>
<tr>
<td>expectations about technologies that will be used.</td>
<td></td>
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</tbody>
</table>

Other Approaches and Methods: Media Selection and Media usage in DDL, Total Quality Management and ISO Certification; Studies Focusing on Computer-mediated Communication

<table>
<thead>
<tr>
<th>Conclusions</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Consider media selection when evaluating DDL.</td>
<td>• Determine the appropriateness of selected media or specific cultural settings.</td>
</tr>
<tr>
<td>• Consider the cultural acceptability of media selected for DDL.</td>
<td>• Evaluate the validity and reliability of data used in a total quality</td>
</tr>
<tr>
<td>• Total quality management of DDL is possible: overall quality management</td>
<td>management process.</td>
</tr>
<tr>
<td>and control programs have been evaluated, as have ISO certification</td>
<td>• Conduct monitoring and coaching activities for interaction processes in</td>
</tr>
<tr>
<td>programs.</td>
<td>computer-mediated settings.</td>
</tr>
<tr>
<td>• DDL introduces a new way of interacting: computer-mediated communication.</td>
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</tr>
<tr>
<td>Transferring face to face communication to computer-mediated environments</td>
<td></td>
</tr>
<tr>
<td>is not a straightforward task.</td>
<td></td>
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Bregar, L., and Zagmajster, M. 1996. Development of a Distance Education Programme at the Faculty of Economics, University of Ljubljana. In Developing Distance Education Systems in Central and Eastern Europe, Guidelines. EADTU (European Association of Distance Teaching Universities): Heerlen.


Georgiev, K., Naumov, V.; Panov, E.; and Patev, H. 1998. Necessity and possibilities for innovations in Bulgarian education, connected with the development
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Appendix 1
Calculation Model

University of British Columbia
“Develop, design & delivery of technology based distributed learning (course code EDST 565f),” 13-week course involving 40 students.

Variable Costs

<table>
<thead>
<tr>
<th>Type of cost</th>
<th>Item</th>
<th>Amount (in Can$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed costs</td>
<td>Course design/ setup:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Staff time (50 hrs)</td>
<td>2,262.29</td>
</tr>
<tr>
<td></td>
<td>• Travel</td>
<td>311.67</td>
</tr>
<tr>
<td></td>
<td>Development</td>
<td>15,993.37</td>
</tr>
<tr>
<td></td>
<td>Marketing</td>
<td>3,709.80</td>
</tr>
<tr>
<td></td>
<td>Copyright clearance</td>
<td>700.00</td>
</tr>
<tr>
<td></td>
<td>Overhead to university</td>
<td>2,585.70</td>
</tr>
<tr>
<td></td>
<td>Overhead to own division</td>
<td>9,131.97</td>
</tr>
<tr>
<td></td>
<td>Library</td>
<td>1,000.00</td>
</tr>
<tr>
<td></td>
<td>Server costs</td>
<td>300.00</td>
</tr>
<tr>
<td></td>
<td>International tutors</td>
<td>2,000.00</td>
</tr>
<tr>
<td></td>
<td>Faculty of Education Academic Approval</td>
<td>4,000.00</td>
</tr>
<tr>
<td></td>
<td>Video conferences</td>
<td>1,544.50</td>
</tr>
<tr>
<td></td>
<td>2nd phone hook up and fees (6 months)</td>
<td>225.90</td>
</tr>
<tr>
<td></td>
<td>Miscellaneous</td>
<td>305.94</td>
</tr>
<tr>
<td><strong>Total fixed costs</strong></td>
<td></td>
<td><strong>$44,071.14</strong></td>
</tr>
<tr>
<td>Variable costs</td>
<td>(depending on the number of students, here N=40)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Instructional time</td>
<td>16,344.28</td>
</tr>
<tr>
<td></td>
<td>Administration/ registration</td>
<td>12,365.08</td>
</tr>
<tr>
<td></td>
<td>Printed materials</td>
<td>1,500.00</td>
</tr>
<tr>
<td><strong>Total variable costs</strong></td>
<td></td>
<td><strong>30,209.36</strong></td>
</tr>
<tr>
<td>Total costs of online version</td>
<td></td>
<td><strong>$74,280.50</strong></td>
</tr>
<tr>
<td>Revenue (student fees)</td>
<td></td>
<td><strong>$43,980.04</strong></td>
</tr>
<tr>
<td>Total costs if set up in a face to face setting</td>
<td></td>
<td><strong>$96,000.00</strong></td>
</tr>
</tbody>
</table>

Appendix 2
Technology Decision Instrument
### Functional Model–Open Learning/Communications/Media–Examples

<table>
<thead>
<tr>
<th>Type</th>
<th>A1 Broadcast TV</th>
<th>A2 Broadcast TV plus added value</th>
<th>B Multimedia computing</th>
<th>C1 Print</th>
<th>C2 Print plus added value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Purpose and curriculum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wide dispersion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large number</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(ii)a Content instructional design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual based</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entry level courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storyboard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tape segments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Questions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some feedback</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e.g., art history</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(ii)b Media packaging</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video studio production</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Studio production</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Tape editing</td>
<td></td>
<td></td>
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<tr>
<td>Tape packages</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>(iii) Primary delivery technology</td>
<td></td>
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<tr>
<td>Broadcast television</td>
<td></td>
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<tr>
<td>TV plus training tapes</td>
<td></td>
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<tr>
<td>(iv)a Delivery platform</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>TV set–home base</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>TV set</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Home</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Mail</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(iv)b Peripherals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Videotape recorder</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(v)a Usability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Familiar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reliable interface</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed time</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>(v)b Application (C = Cost</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B = Benefit; V = Value)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Appendix 3
Centers of Excellence

Per a review of extant literature, and input of leading authorities, a number of institutions that function on a high level have been designated as centers of excellence. In this section we present a list of those centers, describe some projects and indicate key persons who can be contacted to obtain more specific information.

A3.1. University of British Columbia–Centre for Distance Education & Technology Continuing Studies

The Centre for Distance Education & Technology Continuing Studies at the University of British Columbia, Canada is known for the activities of its director Tony Bates (tbates@ubc.ca). He has been involved in the startup of a large number of international distance learning and DDL institutions and projects. Some of his activities involve work in developing countries. In this report we mentioned some of the projects administrated by the Centre, such as the online noncertificate distance learning program offered worldwide, as well as a Spanish language version managed by a Mexican partner.

A3.2. Centre for Research and Development in Teacher Education, School of Education, The Open University, U.K.

A summary of recent Open and Distance Learning (ODL) research and project activities in teacher education and training in developing countries (based on information provided by Jae-Eun, Joo, j.joo@open.ac.uk and Prof. Moon, B. r.e.moon@open.ac.uk).

The Centre for Research and Development in Teacher Education (CReTE) is the newest center in the School of Education at the Open University, U.K. The center was created around the teaching, research, and teacher-development interests of the academics who were brought together in 1992 to design, write, and implement the Open University Postgraduate Certificate in Education (OUPGCE). The OUPGCE is the largest open and distance learning initial teacher education course in Europe and is taught using the open learning techniques and a mix of different media such as text, video, audio, TV, and ICT pioneered by The Open University.

One of the main research interests of the Centre is in ODL and new technologies in teacher education. Specific projects include the following.

**Project 1: The Enlaces Project, Chile**

This interactive, multimedia pilot project is part of a series of projects developed in Santiago. Schools and teachers have been provided with hardware to establish
electronic communications locally and, in some instances, more widely through national and international collaboration. The project illustrates the interrelationships that can be established between technological initiatives to improve school performance and the development of new models of teacher education.

Teachers working with the indigenous Mapuche Indians, who have no written language, are developing multimedia methods to record a sound dictionary in Apuche to keep the language alive. Electronic conferencing underpins this project. First reports point to the early success of the program. Once training was completed, 97 percent of the participating teachers stated that they had developed a significantly more positive attitude toward computers. Despite their need for considerably more practice in the use of the computers, 70 percent of the teachers felt that they could adequately utilize the computer to support their normal educational activities.

**Project 2: The KUALIDA and TEMPUS Projects, Albania**

(a) The KUALIDA project: This program aims to establish an in-service training program using open and distance resources for primary teachers of English, History, French, Geography, Albanian Language, and Civics.

(b) TEMPUS program: Participation in an EU TEMPUS funded project for the restructuring of teacher education in Albania. This project is in partnership with the University of the West of England and the Royal School of Danish Educational Studies.

**Project 3: The PPMU/Ministry of Education in Egypt Project**

The Egyptian government is rapidly establishing the infrastructure to support the development of open and distance learning (including the application of interactive computer technologies) in teacher education. The application of new programs will be directed at first phase basic education needs but this will be extended to other initiatives (secondary education, higher education) where staff training needs also exist. A number of center members have been involved in evaluation and development work as consultants. The following two tasks deal with new technology in particular.

1. Establishing an interactive computer technology environment to support all aspects of the education reform program in Egypt with initial focus on open and distance learning and teacher education.
2. Setting up resources (text, audio visual, and electronic) to establish an ODL Resource Center.

**Project 4: The Project in Partnership with SAIDE**

One project is to set up 4-year part-time upgrading programs with 50 percent school-based courses. This requires local communication centers for tutoring and uses interactive technologies. Furthermore, this program is linked to school principals training programs.
A3.3. Technikon–South Africa

Analysis of dropout rates in South Africa, resulting in disproportionate success rates of white and black pupils, has resulted in attempts of Technikon to deal with this issue by investing more in support provisions. Victor (1997) describes a model for support in distance learning, also leveraging the potential of digital media. She states that the high failure rate in distance learning institutions (she gives examples related to the University of South Africa [UNISA] and Technikon) can be seen as a symptom of inadequate distance learning models. The percentage of graduates in 1997 compared with the total enrollment since the start of the courses (1984–1988) varies between 4.7 and 17.4 percent. She concludes that distance learning should be more than just the distribution of course material, evaluation of learner efforts and administration of the education process to be successful. She states that distance learning should offer coursework designed to meet the learners’ needs, but should also be enhanced by additional support to the learner. She offers a model to achieve this and provides examples that can contribute to the reduction dropout rates. The model developed elaborates the components of

Figure 2. Components Model for a Learner Support System
a learner-support system for marginal distance learners at tertiary level, which can guide them through initial career development stages.

Examples of action based on this model include:

- Information Clearing Houses facilities to promote information flow by making appropriate information and resources available, including information on technology-enhanced learning; existing physical infrastructure for education and training; existing technologies; current South African and international technology-enhanced initiatives; South African and international evaluation reports; available course materials; general research on the use of technologies in education and training; and South African and international personnel organizations. More information is available at http://pgw.org/telisa, or contact Paul West (pgwest@ibm.net).

- The job placement project assists learners in finding casual, temporary, or full-time employment. A computerized database of approximately 3,000 learners is kept at the central campus and updated annually. The service is advertised (by mail, visits, and through the Internet) to employers.

- Technikon SA uses a set of distance career guidance questionnaires. It serves as a self-evaluation for learners and guides them in making career and study choices that are compatible with their aptitudes, interests, and personalities. Learners who have Internet access can visit the Student Development Unit’s web site at http://www.trsa.ac.za/main_campus/depts/sdu/sdu.htm.

- An academic support program, called the HELP program (Helping to Ensure Learner Progress) was developed. The HELP program serves as an orientation to tertiary distance studies and helps develop skills needed to progress successfully. It covers topics such as personal development, communication skills, reading, writing, study skills, and preparing for interaction with the world.

### A3.4. The Commonwealth of Learning–COL

COL is an international organization created by Commonwealth Heads of Government to encourage the development and sharing of open and distance learning resources and technologies. The organization supports a substantial number of projects, centers, and fellowships in international collaborations with developing countries. The COL involvement clearly shows a high concern for all kinds of evaluative aspects, as described earlier, and in relation to the “systems approach” towards evaluation, such as needs analysis, student assessment, student follow-up, regional impact, development of evaluative expertise, and so on. Typical projects include:

- Desktop video production: a low-cost, relatively high-tech alternative for the Maldives for English language teaching at a distance.

- The Rajiv Gandhi fellowship scheme in collaboration with the Indira Gandhi National Open University (IGNOU): a pilot program in 15 developing countries
to help students acquire skills and experience necessary to contribute to the enhancement of educational opportunities in their own countries.

- The Commonwealth Educational Media Center for Asia that serves as a regional media information, resource and training center; the center facilitates co-production for broadcasting, packaging, translation, programming, etc.
- Establishment of a computer-training center on the Copperbelt in northern Zambia.

More information can be obtained at www.col.org/models/table.htm

A3.5. Laurentian University, International Programs and Projects

Mayer & Roy (1997) describe a Canadian-Chinese collaborative five-year project that helped establish DDL programs in western China. The project focused on an external analysis of staff expertise and the empowerment of the local Chinese partner. The Chinese partner in the project is South Western Institute of Technology (SWIT) that services the entire Mianyang region, which encompasses many isolated and smaller cities, has a population of 5 million people, and covers some 20,000 square kilometers. Many of these people belong to one of the 55 minority ethnic groups officially recognized in China. The Laurentian University project is organized in close collaboration with the Canadian International Development Agency (www.acdi-cida.gc.ca, Hull, Quebec, Canada).

As of December 1998, the project is still in operation, and is evaluated through a series of mid-term reviews. The following list presents major questions included in these reviews:

1. How does the program strategy provide an appropriate method for CIDA to support institutional capacity development needs in China?
2. How is the program designed to provide appropriate investment levels for each component in the program?
3. To what degree are program goals and objectives being achieved?
4. What are the program achievements and effects on the partners’ capacity and relationships?
5. How efficiently is the program being implemented and managed?
6. What lessons are being learned that might guide the remainder of the program?

Project documentation consists of a macro-evaluation framework that contains evaluation aims, evaluation areas, evaluation techniques, and so on. In view of the different phases in the planning: pre-implementation, implementation, ongoing program operations, program handover/takeover, program outcomes, lasting impacts/post-program end.

More info can be obtained from Melissa Keeping (M.keeping@nickel.laurentian.ca), Manager International Programs and Projects.
## Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AECS</td>
<td>Association of European Correspondence Schools, <a href="http://www.xxlink.nl/aecs/index.htm">http://www.xxlink.nl/aecs/index.htm</a></td>
</tr>
<tr>
<td>BRAOU</td>
<td>Dr. B.R. Ambedkar Open University of India, Hyderabad, India.</td>
</tr>
<tr>
<td>CADE</td>
<td>Canadian Association for Distance Education (<a href="http://www.cade-aced.ca">www.cade-aced.ca</a>)</td>
</tr>
<tr>
<td>CALIBER-NET</td>
<td>A project in the context of the Socrates ODL (Open and Distance Learning) Programme of the European Commission. It focuses upon Quality in European Open and Distance Learning (<a href="http://europa.eu.int/en/comm/dg22/socrates/odl/quality.html">http://europa.eu.int/en/comm/dg22/socrates/odl/quality.html</a>).</td>
</tr>
<tr>
<td>CATV</td>
<td>Critical Analysis of community antenna TeleVision</td>
</tr>
<tr>
<td>CMC</td>
<td>Computer-Mediated Communication: concept to assign all synchronous and asynchronous uses of ICT to facilitate interaction</td>
</tr>
<tr>
<td>COL</td>
<td>Commonwealth of Learning, Vancouver, Canada (<a href="http://www.col.org">www.col.org</a>)</td>
</tr>
<tr>
<td>CVT</td>
<td>Compressed Video Conferencing</td>
</tr>
<tr>
<td>DDE/DDL</td>
<td>Digital Distance Education / Digital Distance Learning—Third-generation distance education</td>
</tr>
<tr>
<td>DE</td>
<td>Distance Education</td>
</tr>
<tr>
<td>EADTU</td>
<td>European Association of Distance Teaching Universities internetadres toevoegen</td>
</tr>
<tr>
<td>EC</td>
<td>European Commission (head office: Brussels), the central body that coordinates European policies (<a href="http://www.europa.eu.int">www.europa.eu.int</a>)</td>
</tr>
<tr>
<td>ECB</td>
<td>Evaluation Capacity Building</td>
</tr>
<tr>
<td>EDEN</td>
<td>European Distance Education Network (<a href="http://www.eden.bme.hu">www.eden.bme.hu</a>)</td>
</tr>
<tr>
<td>ICDE</td>
<td>International Council for Distance Education (<a href="http://www.icde.org">www.icde.org</a>)</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and Communication Technologies</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
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</tr>
<tr>
<td>IRR</td>
<td>internal-rate-of-return approach to cost-benefit analysis</td>
</tr>
<tr>
<td>ITESM</td>
<td>Instituto Tecnologico y de Estudios Superiores de Monterrey: higher education institution in Mexico with a close collaboration with University of British Columbia, Canada (<a href="http://www.bsu.edu/international/cip/itesm.htm">www.bsu.edu/international/cip/itesm.htm</a>)</td>
</tr>
<tr>
<td>NPV</td>
<td>net-present-value approach to cost-benefit analysis: amount of $ to be invested in order to gain a certain return in the future</td>
</tr>
<tr>
<td>ODL</td>
<td>Open and Distance Learning</td>
</tr>
<tr>
<td>OFEK</td>
<td>OFEK is a private system for interactive distance learning via satellite and operates in a joint venture between Gilat Communications Ltd. (<a href="http://www.gilat.net">www.gilat.net</a>) and the Open University of Israel. It includes Lernet and Trainet.</td>
</tr>
<tr>
<td>OPENET</td>
<td>Indian Organization structure for the national and state open universities and correspondence course institutions by the Distance Education Council Takwale (1997).</td>
</tr>
<tr>
<td>PB</td>
<td>pay-back and break-even approach to cost-benefit analysis</td>
</tr>
<tr>
<td>PHARE</td>
<td>European development program, set up by the European Commission DG XIII with the aim to develop Central and Eastern European countries. Part of the program is multicountry cooperation in distance education.</td>
</tr>
<tr>
<td>ROI</td>
<td>return-on-investment approach to cost-benefit analysis</td>
</tr>
<tr>
<td>SAS</td>
<td>Statistical Analysis System: computer package to analyze statistical data.</td>
</tr>
<tr>
<td>SOCRATES ODL</td>
<td>European action program for cooperation in the field of education, set up by the European Commission Directorate General XXII to develop international projects; among them ODL projects (<a href="http://www.connect.ie/domino/socrates.htm">www.connect.ie/domino/socrates.htm</a> or <a href="http://europa.eu.int/en/comm/dg22/progr.html">http://europa.eu.int/en/comm/dg22/progr.html</a>).</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical Package for the Social Sciences</td>
</tr>
<tr>
<td>STOU</td>
<td>Sukhothai Thammathirat Open University of Thailand</td>
</tr>
</tbody>
</table>
| TEMPUS       | Trans-European cooperation scheme for higher education. This is a development program adopted by the Council of Ministers of the European Community to develop education in Eastern European countries. It is operated in the Phare-program (focus on Central and
Eastern Europe) and the Tacis program (focus on newly independent states, former Soviet Union and Mongolia) (http://ortelius.unifi.it/eup/tempus/introph.htm#index or http://europa.eu.int/en/comm/dg22/progr.html).

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
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<td>UNA</td>
<td>Universidad Nacional Abierta of Venezuela; part of the Universidad de Los Andes (loto.adm.ula.ve/una)</td>
</tr>
<tr>
<td>UNISA</td>
<td>University of South Africa, Pretoria (<a href="http://www.unisa.ac.za">www.unisa.ac.za</a>)</td>
</tr>
<tr>
<td>WWW</td>
<td>World Wide Web</td>
</tr>
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Experts Contacted

Bartolic-Zlomislic, Silvia, bartolic@cstudies.ubc.ca, Centre of Distance Education & Technology Continuing Studies, University of British Columbia

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